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Networking & VPN

Perform Live Maintenance & Upgrades. Know what hardware and software can be online during upgrades and maintenance and plan ahead to prevent potential damage.

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Troubleshoot Drive Failures. Know how to recognize and rectify drive-related issues.

Servers

Helping Businesses Save Money. ServerMonkey provides National Communication Xchange with the servers and networking equipment it needs.

Security

Comprehensive Backup & Restore. Paragon Hard Disk Manager puts all the backup and restore functionality you need in a single program.

Messaging & Telephony

Avoid Common Issues With Unified Communications. Before you think about whether employees will actually use your UC solutions, you have to make sure your IT department is capable of deploying and supporting them.

Clients

Easy Labeling On The Go. The Brady BMP41 portable label printer can print both continuous and die-cut labels.

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Other features include powerful, seamless bare-metal restore to dissimilar hardware; advanced partitioning; secure disk wiping; and a Boot Corrector utility, which automates recovery from common Windows boot issues.

For enterprises with field technicians, the HDM Technician License helps service systems. "You can have this one tool on a thumb drive and walk up to any machine in your environment and take an image of it for disaster recovery, migration, deployment, or virtualization purposes," Eickhoff says.

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DO ONE THING, and do it well. It's an age-old adage that holds true for Pegasus Computer Marketing, which has been in business since 1987.

Although the products and services the company offers have changed through the years, driven by the shift away from mainframe hardware and peripherals, its focus remains on being a total used hardware provider for sales, repair, parts, and complete systems.

Since the late 1990s, Pegasus has been selling and repairing point of sale terminals and peripherals, barcode equipment, mobile and mounted computers, networking peripherals, and Kronos TimeClocks. It can service nearly any make or model and offers new and used parts and complete systems.

Pegasus performs all depot maintenance, flat-rate repair, sales, and buyouts from its 7,500-square-foot facility in Forney, Texas.

Having a central location allows the company to provide the best in technical and sales staff expertise and stay current on trends and the prices and availability of equipment its customers use.

All hardware sold or repaired by Pegasus is tested, refurbished, and foam-packed for shipment by staff right at its facility, ensuring total quality control and the ability to quickly turn around emergency requests from customers.

The company has stood the test of time and, in fact, still performs repairs and maintenance for some of the same retailers that have been trusting the company since day one, along with countless other companies that need a quality, reliable repair center. P

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CASE STUDY

Helping Businesses Save Money

By Purchasing Previously Owned IT Equipment From ServerMonkey, National Communication Xchange Can Offer Customers Flexibility, Cost-Savings

Most companies really work hard to provide their customers with the best service at the best possible price. But that's not always easy, particularly when you're a boutique data center such as National Communication Xchange that owns and operates a Tier II-class data center.

NCX's success and growth—it is expected to add about 2,000 square feet next year—is focused on providing customers with an undisputable balance of economy and service.

NCX provides its customers, which consist primarily of startups and small and mid-sized businesses that eventually become established companies, with dependable, quality service at a price point that many larger data center operators simply don't entertain.

ServerMonkey helps NCX do just that by providing the used servers and networking equipment NCX needs. By purchasing previously owned IT equipment from ServerMonkey, NCX can offer its customers increased flexibility in operating income while providing access to a level of equipment that may not have been previously available.

National Communication Xchange considers itself fortunate to have found a reliable and dependable partner in ServerMonkey. With ServerMonkey, NCX can source its equipment from a large inventory of reconditioned products that come with full warranties.

ServerMonkey is committed to customer service and provides each customer with a dedicated representative. "Our representative reacts to requests and needs as if he is part of the team, with quick turnaround on quotes and order fulfillment. Any corrections or changes to orders have been handled flawlessly and with a high level of professionalism," says Jim Grmek, vice president of sales and marketing at NCX.

It's that service, along with ServerMonkey's pricing, inventory, and warranty, that help NCX meet its customers' needs for expanding their businesses while watching their budgets. P

FEATURED PRODUCT

Easy Labeling On The Go

Brady BMP®41 Portable Printer Offers Both Die-Cut & Continuous Labels For Use In A Variety Of Datacomm & Electrical Applications

Anyone who has spent time labeling cables, patch panel strips, faceplates, or other equipment knows what a hassle it can be. You print the labels, cut them, and make sure they stay in sequence only to get to a job site and find out you've forgotten or lost a label or smeared the printed text.

It's those types of headaches that the Brady BMP®41 portable label printer helps avoid.

The printer is unique in its ability to print both continuous and die-cut labels, says Matt Luger, Brady's regional product specialist for printers.

The BMP41's ability to print die-cut labels that are pre-cut and pre-spaced inside a cartridge eliminates the time- and money-wasting issues associated with continuous printers while still offering continuous labels for certain applications.

The printer can handle any labeling need, including flags, wraps, strips, and small labels for both indoor and outdoor use. And it is easy to use—it automatically recognizes the label installed and defaults to the correct rotation, format, size, and font, with the ability to override any default settings.

Rubber guarding, bumpers, and a grab-and-go grip ensure the BMP41 can handle field and mobile use, including drops and bounces. An optional magnet easily attaches to the BMP41, so users can affix the printer to a metal cabinet or panel.

Brady offers the BMP41 without the expensive investment typical of other die-cut printers. It costs just $299, including the printer, long-life NiMH battery, charger/AC adapter, one label cartridge, and a USB cable.

"Never before has there been a printer at a sub-$300 price point that allowed users to get this full, robust set of labeling capabilities and labeling muscle," Luger says. P

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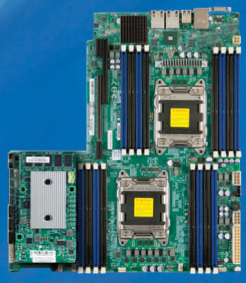

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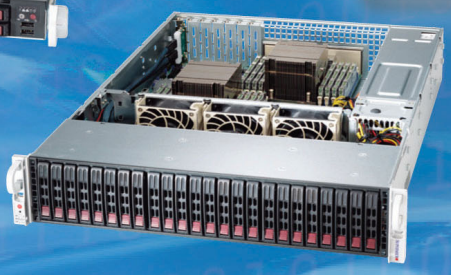

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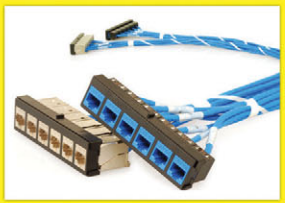

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Mobile, Cloud & Big Data Big Topics For 2014

The "3rd Platform," or what research firm IDC calls the industry's emerging platform for growth and innovation built on mobile computing, cloud services, big data and analytics, and social networking, will shape the year ahead.

Here are IDC's top predictions for the coming year:

- Worldwide IT spending will grow 5%; spending on 3rd Platform technologies will increase 15%.
- IT spending in emerging markets will grow 10%, contributing to 35% of worldwide IT revenues and more than 60% of worldwide IT spending growth.
- Within the 3rd Platform, value will migrate from infrastructure as a service to platform as a service.
- Tablet sales will increase 18%; smartphone sales will be up 12%.
- Spending on cloud services, and the technology to enable these services, will increase 25%.

Few Changes In Latest TOP500 Supercomputers List

The world's top three most powerful supercomputers remained the same in the newest TOP500 list. In all, the total combined performance of the 500 systems reached 250 petaflops per second; 31 of the systems had performance that topped a petaflop per second (up from 26 on the June list). The United States is the leading user of high-performance computing systems with 265 entrants on the list. Here's a rundown of the top five supercomputers:

System Name	Location	Performance (petaflops per second)
Tianhe-2	China	33.86
Titan	United States	17.59
Sequoia	United States	17.17
Fujitsu's K	Japan	10.51
Mira	United States	8.59

Gartner Advises A Twin Data Center Topology

Most enterprises with worldwide operations could benefit from consolidating their data centers, according to analysts at Gartner. "It's a fact that most global organizations run too many data centers in too many countries. This is normally the result of business expansion, either organically or through acquisition over many years," says Rakesh Kumar, research vice president at Gartner. Having too many data centers results in excessive capital and operational costs, an overly complex architecture, and a lack of business-IT agility, he says. For most organizations, Gartner reports, having two data center sites each for North America, South America, Europe, Africa, and Asia/Pacific will provide what's needed for adequate disaster recovery, better management, and streamlined business expansion.

BYOD Momentum May Be Slowing

Although the bring your own device, or BYOD, trend continues to advance, the speed of its growth may have slowed somewhat this year. A report on global business smartphone shipments by Strategy Analytics shows that the number of new smartphones purchased by corporations for business use by their employees has grown throughout this year. In the third quarter, for example, Strategy Analytics data shows that more than 35% of smartphones sold for business purposes were corporate-liable; that's up from 32% a year ago and 31% in the first quarter of this year. North American

companies have been among the quickest to accept BYOD, but third-quarter sales of corporate-liable smartphones were up 13% from a year ago after flat to declining volume for much of 2012.

Your Smartphone Could Become Smarter Than You

Smartphones of the future could become our secret digital agents, but only if we're willing to provide the information they require, says Carolina Milanesi, research vice president at Gartner. By 2017, Gartner predicts mobile phones will be smarter than people because the cloud and data stored there will provide phones with the computational ability to make sense of the information they have. To begin with, Gartner reports, smartphones can assist with time-consuming and time-wasting menial tasks such as calendaring, creating to-do lists, and responding to mundane emails. Gradually, though, consumers will allow apps and services to take control of other aspects of their lives, according to Gartner, introducing the era of cognizant computing.

Private Cloud Solutions To Generate $69 Billion By 2018

According to the latest "Private Cloud Customer Report" from Technology Business Research, worldwide business adoption of private cloud computing solutions could produce as much as $69 billion in revenues by 2018. "Private cloud has truly come into its own as a delivery mechanism that customers understand and are using to achieve the benefits of cloud where public options are either not available or viable," says Allan Krans, lead cloud practice analyst for TBR. The study, which surveyed 650 cloud-using companies in North America, Europe, and Asia, found that current private cloud target areas for companies include CRM, HR, and storage.

Tech Companies Should Think In Terms Of 10-Year Life Cycle

Gartner analysts say technology-driven companies need to keep in mind a 10-year life cycle and prepare for the disruptive force of smart machines. "Long-term expansion cycles influence all businesses, and your major competitor in 10 years—if you survive that long—probably does not exist today," says Steve Prentice, vice president and Gartner fellow. This comment stems from Gartner's notion that technology-driven life cycles usually last 10 years or less. Prentice adds that tech businesses today should prepare for the scale of automation smart machines will introduce.

Mixed Reaction Among CIOs To The Power Of Mobility

According to a recent independent survey of 300 IT decision makers in the United States and U.K., 78% of CIOs report that their businesses have a mobility strategy, but a majority of respondents see problems with mobility. For example, 72% find it too costly to integrate mobile solutions with existing applications, 86% think their businesses haven't optimally used mobility to expand business, and 66% think mobility solutions are simply too complex. According to Mobile Helix, which sponsored the study, companies today are finding the most benefits in the mobility area from secure offline/remote access, device storage, and push updates.

IDC Reports On IT Spending In Financial Services

Research firm IDC expects IT spending among worldwide financial services will pass $430 billion next year. Banks, at $215 billion, will account for half of all financial services IT spending next year. North American and European financial institutions will see modest growth at less than 5% through the year; those in Latin America, the Asia/Pacific region, the Middle East, and Africa will experience greater than 7% growth. Karen Massey, senior analyst with IDC Financial Insights, says financial services will be spending money on risk and compliance, core and infrastructure modernization, customer experience, and security.

Study Looks At Impact Of Health IT Adoption

For years, there has been talk about how the use of health IT—electronic health records, clinical decision support, order entry, and Web portals—can benefit both healthcare providers and patients. But a new study by Health Affairs provides a look at just how big that impact could be. According to the report, if just 30% of community-based physicians' offices fully implemented health IT, the demand for physicians would reduce 4 to 9%. Delegation of care to nurse practitioners and physician assistants could further reduce demand for physicians by 4 to 7%. One of the biggest gains could be in solving regional physician shortages as the implementation of health IT could enable up to 12% of care to be delivered remotely or asynchronously. Health Affairs expects that 30% of physicians' offices will fully implement health IT in the next five years.

Make Sure Your Storage Can Handle Big Data

Tips To Quantify Unstructured Data, Analyze Its Purpose & Harness Its Value

As enterprises amass ever-increasing amounts of data, IT managers are recognizing the need to analyze and process these huge data collections. And in order to keep these large data sets accessible to analyze them and classify their practical application, you need to be able to scale out data storage as your file systems evolve.

If you haven't already determined how your company will handle the potential growth of billions of files, it's time to consider what kind of capacity you'll truly need.

Face Obstacles Head-On

Although it may be easier at the moment to push back against the big data trends that are starting to emerge, such as clustered NAS and hyperscale storage, the need for efficiency and scalability will inevitably come to the forefront for IT decision makers.

John E. Burke, CIO and principal research analyst at Nemertes Research, says when IT leaders are wrestling with big data problems, they can run into issues with quantity of data and storage system performance.

"They can't get the data off their existing infrastructure fast enough, in the forms they want to work with. Files or objects can be too big, or too numerous, or both, and latency in retrieval cripples fast analysis. And they can't afford to scale their existing systems up (more capacity) and out (more spindles to make response time better) to meet the need."

In light of these imposing issues, it's important that data center managers thoroughly examine how to deal with the rapid growth of information assets. "Most resort to distributed analysis and storage," Burke says. "Scale-out systems, whether Hadoop-driven or otherwise, divide the data and allow parallelized access to it."

Be Open To Flexible Storage Architectures

When it comes to making purchases, Pund-IT President and Principal Analyst Charles King says there isn't any one storage solution or architecture that's best for big data, but rather, it's a matter of use cases.

"For example, if a company is contending with extremely large files being accessed constantly by large numbers of employees and/or customers, a distributed file system solution is worth considering," King says. "If the issue revolves around hosting hundreds or thousands of virtual employee desktops, a flash-based solution is often the best way to go. Analytics is a popular use case for big data, but storage requirements can vary widely according to the analytics platforms or technologies being employed."

On the macro level, Burke says data center managers should keep in mind the full life cycle of data, including "how it will get onto the storage; how it will be managed and used for analysis while it is there; and how it will be handled once the analysts are done with it." To accomplish the latter task, you should determine if the data will be removed, archived, or left online, and if so, will it be stored on less expensive (or slower) systems, Burke says.

Know The Four "V's": Velocity, Variety, Volume, Value

When we talk about big data, we talk about four "V's": velocity, variety, volume, and value, says David Drysdale, Ph.D., consulting analyst at Info-Tech Research Group. "Big data applications require robust performance capabilities—that is, velocity—in order to perform the kind of analytics that drive big data value. There's also an incredible variety of data that is being collected," Drysdale says.

"Companies are hoping to squeeze every last dollar out of everything from mouse-clicks to geospatial data to emails to video—it is unstructured and doesn't fit into a database all that well. This all leads to an incredible volume of data," he says. Drysdale adds that companies are holding on to increasingly larger amounts of data for longer periods of time, just in case they can monetize what they have and derive value from it.

The Difference Between Strategy & Technology

As with most major IT transitions, there's a temptation to buy the "big solution" and assume it will get the job done. To that end, David Drysdale, Ph.D., consulting analyst at Info-Tech Research Group, says enterprises can mistake technology for strategy, trying to buy their way around having a proper data management strategy. "It can lead to big problems and unexpected costs down the road. You need to have a clear idea of the data you want to keep and, most importantly, what you can get rid of."

King says the biggest mistake a company can make is to believe everything a salesperson or vendor says. "Big data storage is one area where doing your homework and effective comparison shopping can pay huge dividends," he says.

Decide What To Keep & What To Purge

As your company works to innovate from within the IT department, allowing the "big data shift" to infiltrate the rest of the organization, it is helpful to recognize that new data restructuring processes don't have to fully replace your current data management systems.

However, King says that one interesting thing about big data "is that it often inspires businesses to access and use information assets in new and intriguing ways that can often be hugely beneficial to the organization."

There should also be an emphasis on what data you're going to scrap, Drysdale says. "Think about what data you're going to keep, and, maybe more importantly, what you are going to get rid of. Don't agree to keep everything forever just in case. Figure out what is actually valuable first. A good sense of these requirements is what should be driving your storage purchase." P

Make Big Data Work For You & Provide Results

Not only can innovative solutions designed for big data enable organizations to scan, order, and analyze growing volumes of data, says Charles King, president and principal analyst at Pund-IT, but they can also help obtain results much faster than ever before. For example, King says, "it's fairly common for a global business to apply analytics to all of their complex sales data in order to gain a complete picture of performance by region and to determine which teams/salespeople are doing well, which need help, and how or where things can be improved."

King says that if you use an in-memory database solution to assemble and run analytics, you can complete the job in a shorter amount of time. This means companies can use big data technologies to update results monthly, weekly, or even daily.

BONUS TIPS:

Be Aware Of Every Data Need Within The Enterprise

Because big data is accumulating at such an incredible rate, David Drysdale, Ph.D., consulting analyst at Info-Tech Research Group, says it's critical to find a way to increase available capacity and performance as needed. Although it may be obvious that scalability is important to any storage strategy, those needs are amplified with big data, he says. "Tiering is also important. High-intensity workloads can move over to more high-performance storage, such as flash, while cold data can be kept on lower-cost disk. High availability is also critical." Remember, as well, that big data differs from traditional enterprise data and will put multiple demands on your system in terms of volume, structure, and real-time change.

Make Decisions As A Team

Once you've determined the requirements of your big data restructure, Drysdale says that you must consider "how you need to access the data, the kind of processing speed you require, and the complexity and the variety of the tasks you need to perform." Evaluate vendors that meet your requirements and compare their implementation processes plus how easy the solutions will be to learn and maintain. In the final phases, Drysdale says you should fill out your data team and have a master data management strategy in place so you "have firm policies around what you keep, what you get rid of, and what is the authoritative source of your information."

Perform Live Maintenance & Upgrades

Update & Change Systems With As Little Disruption As Possible

IT TEAMS OFTEN struggle to find the right time to install upgrades and updates or to perform maintenance because employees rely on technology 24/7. "Due to globalization and mobilization, there is often little downtime available for scheduled maintenance of mission-critical systems," says Donna Scott, vice president and distinguished analyst at Gartner.

This leads many data centers to attempt live or online upgrades or maintenance that occur while a piece of hardware of software is still up and running. Although this is possible in certain circumstances, it isn't necessarily a fit for every system.

It's important to not only know what hardware and software can and should be online during upgrades and maintenance, but it's also important to prevent potential damage through planning.

Design For Maintenance

If you haven't developed a maintenance plan for your infrastructure, then you're already behind. Greg Schulz, senior advisory analyst with the Server and StorageIO Group, says you have to "design for maintenance in how you configure your hardware, software, and systems, but also with what best practices you use."

You can't simply hope that in the future, if an update is needed, you'll be able to implement it without issues and without downtime. You have to build your infrastructure so you have some level of redundancy and a backup system. But at the very least, you need to adjust your change management strategy to prepare for issues in the future and track changes.

Get Started

The first question you have to ask yourself is whether your employees are capable of handling live upgrades or maintenance. "It might be fun to do the upgrade, but would it be more cost-effective to have your people thinking things through, doing the planning, checking, and validation, and the change management, and then have someone else do the work?," asks Greg Schulz, senior advisory analyst with the Server and StorageIO Group. "Or, it may be the reverse where you bring the expertise in to help plan things through that your people actually then go and implement."

"It could be a big giant piece of software, or it could just be something as simple as writing down on a sheet of paper what you're going to change, when you're going to do it, and what the steps are, such that when you're in the middle of doing those upgrades, you effectively have a to-do list," Schulz says.

"You have a copy of where you were before, particularly on the software side, so that at any point you can stop, roll back to a previous step, or just back out altogether. Have that plan and have that checklist, and work off of that so that you know that if something does happen, you're not going to make it worse."

There may be situations where downtime is inevitable or where you suspect a system may not perform at 100%, which is fine, as long as you let the employees who use that application know ahead of time. Schulz says that it doesn't matter if it's 15 minutes, 30 minutes, or an hour, you need to "at least give users a warning that the systems may come down on very short notice." The system may never actually go offline, but if it does, your employees will be prepared and not lose anything they're currently working on.

Key Points

- Design and arrange your equipment for live maintenance well ahead of time.
- Duplicate systems and secondary offsite facilities are great for live maintenance needs but can be expensive to maintain.
- If used correctly, servers running virtual machines make it easier to move assets without causing disruption.

Consider Duplicate Or Redundant Systems

Another way to combat downtime during the upgrade and maintenance processes, Scott says, is to consider

"implementing duplicate systems such that you make modifications to one system while the other is operational, and then bring over users to the new system."

She adds that such an approach also has the added advantage of a rollback plan if changes don't work, meaning you don't have to worry about losing the system entirely if something goes wrong during the upgrade process.

Schulz agrees and says that if an application "is so highly available that functionality needs to be online," he would go even further than to just have one redundant, secondary system. He would have "multiple servers that are backing up and replicating to each other, maybe in different locations, and have everything be fully resilient."

This means you would need to have an offsite facility for backup and disaster recovery that you could fall back on during upgrades and maintenance work. Both Scott and Schulz warn that having duplicate systems and offsite facilities can be expensive, so they aren't necessarily a fit for every company.

Leverage Virtualization

For companies heavily invested in virtualization or smaller companies that can't afford expensive redundancy, duplicate systems, or offsite facilities, virtualized servers can actually make maintenance and upgrades much easier.

For instance, if you have multiple physical servers running virtual machines, all of those VMs are sharing storage. Schulz says this makes it possible to live migrate or quick move virtual machines from one server to another. You can essentially move all of those mission-critical assets from server one over to server two and then perform necessary upgrades and tests before moving those assets back and updating the next server.

Schulz says, though, that you have to be willing to make a solid investment in virtualization, because "unless you use it in the right way, it may actually introduce another point of disruption." P

Action Plan

Plan, plan, plan. It can't be stressed enough how important planning is to live upgrades and maintenance. And if your employees aren't experienced enough, you should seek outside expertise to either help during the planning process or actually complete the tasks for you.

Warn employees. If there is a chance that a system may go down during an upgrade, you need to let employees know. Nothing hurts IT/business relations more than an employee losing all of her work because of unscheduled and unexpected downtime.

Follow the steps. Establish each step in the upgrade or maintenance process ahead of time and record changes either via software or manually for future reference.

Test. If you are using a duplicate system or virtualization, make sure the update works before switching over.

Top Tips

Don't cause damage. Greg Schulz, senior advisory analyst with the Server and StorageIO Group, says that it may sound obvious, but you can't let an upgrade or maintenance turn into a disaster. He says that the state of Oregon recently ran into problems where it had a planned and scheduled upgrade that caused a disaster and put officials into damage control. It can happen to anyone.

Non-disruptive code load. Schulz says that some software uses what's called non-disruptive code load (NDCL), which installs updates while you use software and then forces the user to reboot in order to implement the changes. But he says some vendors can build non-disruptive code load and activation into software, which lets the system pick up changes without a reboot.

Roll out updates. Donna Scott, vice president and distinguished analyst at Gartner, says companies should find or write their own applications with updates in smaller components that can be rolled out independently and without risk to downtime of the entire application. This allows you to upgrade smaller parts of a larger application slowly over time and prevent a potential crash.

Move Beyond Using Only The Password

There Are Better, More Convenient Options To Augment The Traditional Approach

Many people tend to reuse weak passwords for a variety of services, which can be a real security risk if they are using those same passwords within your enterprise. If a cybercriminal breaks into one of the employee's accounts, he may be able to spy on activity and find a way into your enterprise environment. Even worse, some employees may store mission-critical passwords in text files or on sticky notes on their desk.

If that sounds familiar, it might be time to move beyond just the password. Here are a few alternatives, along with tips on how to implement them.

Are There Secure Passwords?

The traditional username and password as a single sign-on certainly has it flaws, but there are ways to implement secure passwords within your network.

"One-time passwords are one of the most secure ways to protect endpoints and systems," says Michela Menting, cybersecurity senior analyst at ABI Research. But, she says, they often need to be used in conjunction with another mechanism to generate the password.

"I don't think we will ever see the eradication of passwords, but we will increasingly see it used in conjunction with other tools, as in the case of multifactor authentication," she says.

Frank Dickson, network security industry principal at Frost & Sullivan, agrees. "Passwords will likely not go away. They will be augmented with other factors to enhance security." He, like Menting, points to multifactor authentication, using multiple forms and factors of authentication in combination to enhance security.

Biometrics: The Next Security Step

Several different forms of biometric authentication are possible, but fingerprint has become by far the most popular way to authenticate who you are by taking advantage of the unique nature of fingerprints. Other options include iris recognition and voiceprint biometrics.

Menting says, "Biometric identification is often touted as the next security step in the way of replacing passwords, although personally, I think they will be used in addition to passwords." Again, Menting says multifactor authentication is the most likely way forward. She notes that a one-time password can be used with mobile devices, and at its simplest form, through an SMS sent to a feature phone, for example.

"It may be the most ubiquitous and cheapest way to deploy multifactor authentication, since you can tie the identity of an individual to the smart card in their phone. Further, you could use this method also for physical access to restricted places," Menting says.

James McCloskey, senior consulting analyst at Info-Tech Research Group, says that although biometrics is popular, there's an adoption problem and some hesitation from employees. McCloskey says that, because of privacy concerns, some people are reluctant to have something about their body (whether it be fingerprint or an iris print), stored. Companies looking to implement biometrics might need to consider voluntary adoption.

Behavioral Options

Menting points to behavioral authentication as another way

Planning Ideas

"I think the first step is to understand what's at risk if you don't go with something that supplements the password," says James McCloskey, senior consulting analyst at Info-Tech Research Group. For starters, understand the costs associated with the help desk and failed password login attempts. You'll also need to understand the costs associated with compromised passwords. That's a first step in building a business case for implementing other authentication means.

When trying to determine and implement the best option for authenticating users, he says, look at the different use cases for the employees you're working with. For example, he says, you might start by focusing on privileged users such as systems and network administrators or a group of users that deal with your most sensitive data or critical systems.

to enhance or even replace the password. Behavioral authentication matches the way a user interacts with a program or device to determine whether it is the same user behavior patterns as registered to an identity. "If the program decides that it is not, it could prompt the user for a password, for example," Menting says.

Examples of behavioral traits that can be used for authentication include the way you speak a phrase or the speed at which you type. However, she says, these behavior authentication methods are often expensive to implement, so they are not yet common.

One of the advantages of a behavioral type of authentication is that it can work over the course of a longer period of time, so it can provide a type of continuous authentication. Software for behavioral authentication can also be tuned to accept a given level for a match, which can help to eliminate false negatives that can annoy users.

Device Fingerprinting

Device fingerprinting or identification is a trend to watch, Menting says. Device fingerprinting technologies are often used in antifraud solutions for online payments and similar financial transactions, she says, and are associated with a specific single device.

"As an extension, we can imagine that a specific single device belongs to a specific single user (i.e., the user owns his device and has a unique PIN code to access sensitive applications). Each device has a particular set of characteristics, which an intelligent system can pull."

Device fingerprinting is the process of pulling information from the device that can help a system recognize this device for subsequent authentications. Menting says unique attributes could include browser, IMEI number, and other possible conditions affected by the device and its characteristics. P

Which One Is Best For You?

The decision of whether you continue to use password-only or implement a mix of other authentication tools will depend on the nature of what you are doing.

Different types of data require different levels of security, says Michela Menting, cybersecurity senior analyst at ABI Research, and considerations include mission-critical applications and compliance or other data protection regulations. "It is always best to build a good security perimeter around islands of data, thereby helping to isolate each one and prevent contamination if there is a breach among one of the islands. Not everyone needs access to everything." In some cases, you may be best served to isolate access to the data, so only certain users will ever have access to it.

Frank Dickson, network security industry principal at Frost & Sullivan, says data center managers should not look for a single authentication solution to satisfy the needs of all of their users. "Multiple options should be provided so that their identity and access management system can be flexible to suit the different authentication needs within the organization."

BONUS TIPS:

Inexpensive Two-Factor Authentication

Multifactor authentication is a good way to strengthen existing security mechanisms and provide a better level of protection. Because many people own mobile phones that can receive text messages, two-step verification is something that can be applied simply by sending out a one-time PIN to the mobile phone number, whether it be a smartphone or traditional cell phone. As such, mobile devices are one of least expensive ways for an enterprise to enact multifactor authentication, says James McCloskey, senior consulting analyst at Info-Tech Research Group. "It's protected by virtue of having the password in the first place. Similarly, when you look at one-time password generators on keyfobs, they will be protected by a PIN number that reduces the risk of a trivial compromise."

Keyfob One-Time-Password

McCloskey says another class of multifactor authenticators is something that you have, which can include a keyfob one-time-password generator or a smart card. "The thing to remember with those is that it's important to have a password along with the device, so that if someone were to lose the device, it wouldn't be a trivial exercise to take advantage of it. In this way, it's a complement to a password, rather than the complete replacement," he says.

Prepare For Wearable Smart Devices In The Workplace

Examine Your BYOD Policies & Establish Clear Boundaries For New Wearable Tech

With almost every popular device that penetrates the mass market, data center managers have the opportunity to prepare for that device's eventual implementation in the enterprise. Such was the case with the ubiquitous adoption of smartphones and tablets in the past several years.

But a new wave of tech is set to roll through the workplace: wearable devices. Although we're still several years away from corporate utilization of smart watches, smartglasses, and other future-forward gadgets, it's never too soon to create a plan to manage these devices in a way that allows end users the freedom they need but provides the security and protection your enterprise needs.

Assess Current BYOD Policies

By now your company should have developed its own bring your own device, or BYOD, policy along with a strategy to ensure that the introduction of new devices won't compromise the security of your network. With this in place, you'll have a good framework for incorporating and expanding wearable device protocol.

Angela McIntyre, research director at Gartner, says IT managers need to determine when and where employees can bring their wearable devices to the workplace.

"Update bring your own device policies to include wearable devices. Employee-owned wearable devices would not be allowed in areas where smartphones are not permitted, primarily due to concerns about photos or video of proprietary assets or documents being taken with the camera feature on the wearable devices," McIntyre says.

Get Started

"Wearables are poised to take off with the advent of Google Glass and other devices. And certainly there are lots of great applications for these wearables, from helping technicians to assisting medical personnel," says David Feinleib, managing director of The Big Data Group. "Just as organizations have created policies and implemented tools to protect sensitive company information, they'll need to do the same for wearable devices," he says. Feinleib says wearable devices should be controlled on an application-by-application basis. Try the new devices out for a couple of specific use cases or key applications to determine how to leverage them, he says.

It's also important to list clear consequences for persons bringing devices into restricted areas such as board rooms, financial trading floors, and manufacturing facilities, McIntyre says.

Determine New Restrictions

As a result of the increasing familiarity workers have with a broad range of gadgets, a culture of casualty, in a sense, has formed in recent years, making it seem acceptable for workers to freely connect their personal devices to a company's wireless network.

Because of this, in the same way companies have added new parameters to keep tabs on (and ultimately accommodate for) employee-owned smartphones and tablets, companies should soon start constructing a new—or augmenting an older—set of guidelines that take into account what type of wearable devices may be part of daily operations and how employees will use them.

Key Points

- Consider how the introduction of wearable devices in the workplace could affect your current BYOD policies.
- Expect employees to connect wearables to your wireless network and plan to establish new security restrictions.
- Decide how your IT department will manage new wearable electronics, whether through the device or through apps.

J. Gerry Purdy, Ph.D., chief mobility analyst at Compass Intelligence, says we're saying the same things about wearable devices as we did about tablets.

"Employees are going to have these new wearables and then ask if they can connect to the corporate network 'just to get Internet access,' but then it gets more complicated when the company wants to monitor and then install various apps in the wearable device," he says.

Companies will have the right to shield the device and make it comply with connectivity restrictions, plus ensure that it won't be able to get unauthorized access to the company IT resources, Purdy says.

McIntyre says companies can also set up geofences to reinforce virtual boundaries for devices. "Geofencing can restrict the ability to use a smartphone or wearable device in higher security areas. The functioning of the camera on company premises (defined by GPS location) can be restricted," she says. "Expand the GPS section of a wireless device policy for geofencing to include both smartphones and wearable devices."

Focus On Managing Mobility

As wearable devices develop, two items will be continue to be important for IT workers: mobile device management (MDM) and mobile applications management (MAM). The former refers to mobile-specific software that protects corporate data on enterprise-issued or employee-owned devices; the latter lets IT manage and monitor only the work-related applications on an employee's device. Neither, however, is specifically optimized for wearable devices yet, McIntyre says.

"The smart watches and smartglasses that employees own are consumer electronics, and MDM solution are not available for them," she says. "Engage with MDM providers to better understand their plans for managing these wearable computing devices."

When it comes to using digital imaging components on wearable devices, for example, IT departments will need to "determine whether present security features in MDM solutions are available and adequate for restricting the functioning of the camera on company premises (defined by GPS location) or at least making a record of when and where employees use the camera feature while at work," McIntyre says.

In terms of leveraging these devices for good and not for evil, Purdy says the biggest issue is to learn about how wearable devices could help the company. "Have a strategy and plan to address the issue before it becomes a big problem." P

Action Plan

Revisit your BYOD strategies. It's early enough to devote time to revising your BYOD policy. Take into account the latest projections about wearable device adoption in the workplace and start trying to measure how your employees will implement wearables at the office or in the field.

Identify new security policies. Weigh the benefits and risks of utilizing mobile device management (MDM) and/or mobile application management (MAM). Anticipate the development of new security apps for wearable devices, as well. Do you need to set up geofencing for wearables? How will you restrict the use of cameras on these devices?

Experiment as much as possible. Before you can roll out mobile device management software, you should look into the numerous ways to test how wearable electronics could boost productivity, streamline efficiency, and change the way your company does business overall.

Top Tips

Prepare for wearable devices in numerous markets. David Feinleib, managing director of The Big Data Group, says wearable devices will show up in workplaces for a variety of purposes. "Field technicians could get on the fly, eye-front information while performing a repair. Medical technicians could gain similar benefits. Wearables also have immense potential to have a positive impact on personal health—small devices that track fitness activity can really help consumers improve their health and help doctors get real-time information about patients at much lower cost than was traditionally possible."

Be proactive, not reactive. Feinleib says companies should get ahead of the curve, and rather than wait for employees to bring these devices to work, they should actively try them out in some narrow, controlled applications to understand how wearable devices will work in real-world situations.

"Wearables" is plural. J. Gerry Purdy, Ph.D., chief mobile analyst at Compass Intelligence, says IT managers need to realize that wearables isn't one thing but a family of things all with wireless connectivity.

Troubleshoot Drive Failures

The Tools, Procedures & Mindsets That Can Help Spot & Fix Drive-Related Troubles

If you were compiling a list of components within a data center that are considered vital to daily operations, storage would certainly make the cut.

Because of how heavily enterprises rely on storage systems, it's imperative data center personnel be well-positioned to recognize and rectify drive-related issues (including full-blown failures) and have preventive measures in place. The following details some ins and outs concerning troubleshooting hard drive issues.

Start Here

One of the most valuable troubleshooting assets managers can have is a range of options, says Greg Schulz, senior advisory analyst at Server and StorageIO. This means having a baseline of what's normal, so you can easily draw comparisons; good backup or standby copies; RAID for resiliency; and copies of encryption keys, security certificates, and the like.

Often, for example, a Windows system might indicate a bad drive and support would suggest reinstalling the OS. "Knowing I have backups or copies gives me a chance to try a quick repair without a lengthy rebuild or restore," he says.

In facing full-blown drive failures, Schulz advises isolating or containing the fault to prevent a larger disaster from occurring. This requires up-front planning and configuring for failure- and fault-containment.

For example, spend extra for quality drives rather than less expensive ones that lack the same resiliency. Additionally, invest in the configuration of drives, such as using RAID 6 vs. RAID 5 or RAID with rapid rebuild along with other enhanced RAID and erasure coding techniques. Also leverage replication to a second storage system for data that's time-sensitive.

Mike Karp, principal analyst at Ptak Associates, says periodic disk defragmentation is an easy way to prevent disk failures. Fragmented disks experience more read operations than those where the file data is stored contiguously, he says. The accumulated added stress from this, however small, contributes to disk failure.

"Defragmentation is easy, painless, and in almost every environment can be a touch-free automated process that's scheduled to run when disk usage is at its lowest," he says.

More difficult is rebuilding a RAID set. "In fact, it's during these rebuilds that a significant portion of disk failures occur," Karp says, typically because of "some sort of operator error." He advises eliminating human interaction by seeking out RAID systems that provide automated rebuild procedures when possible. "The key rule here is that when a disk in a RAID set fails, it should be rebuilt immediately," he says.

Get Diagnostic

Most good storage systems or solutions today include diagnostic capabilities, Schulz says, including predictive detection capabilities. Tools such as SMART can interface with drives to detect and troubleshoot issues. Schulz says

Get Started

To ease troubleshooting tasks, Greg Schulz, senior advisory analyst at Server and StorageIO, says data center personnel need to have a baseline to reference both normal performance and errors and other indicators to help verify a problem is actually occurring. You also need to have tools in place that can interrogate storage systems or devices to verify where the problem resides. "Most storage systems have these tools; however, for smaller or standalone systems, there are also tools that can be used. Of course, having a good backup should go without saying," he says.

Key Points

- It's important to be able to isolate or contain full-blown drive failures so they don't turn into major disasters.
- Have a baseline of drive performance in place from which managers can draw comparisons.
- Moving to newer drive technologies such as SSDs can prevent some drive-related issues from occurring.

many drive issues that appear as problems "may in fact not be an actual bad drive, so some systems can take steps to try and get the drive back in use long enough to copy data off of it."

Schulz says to ensure that the diagnostics and predictive analysis solutions you invest in can determine if there are hard or soft repairable errors and start preventive repair. "Larger systems usually will have these tools; granted, some might be reserved for vendor maintenance personnel," he says.

Some downloadable tools can check drive health and status, run various tests, and query SMART data. "Granted, knowing what to do or not to do can be as important as knowing the tools exist," he says. "The last thing you want to do is cause a bigger problem in the course of fixing a small one."

Limit The Likelihood Of Problems

Karp says the idea of troubleshooting disks is actually a "bad approach to running a data center" for several reasons, including because it's "essentially a reactive concept." A better approach is creating an environment that limits the likelihood of problems occurring.

Troubleshooting disks, he says, is also likely an unsustainable strategy because as disks get larger, they become increasingly prone to errors. As more of these disks enter the data center, the need for fixes will increase. "Few data centers have the time to invest in this sort of thing," he says. Worse, he says, "large disks take much more time to rebuild than do smaller disks. Much more time."

A more strategically viable approach is to look beyond classical RAID and consider newer technologies, he says, including data protection based on error correcting codes (ECCs) and object-based RAID ("objects rather than disks are raided").

"Remember that when a disk goes bad, the URE [unrecoverable read error] can only be fixed by rebuilding the entire disk. With larger disks, this rebuilding process can easily take more than a day," he says. "Rebuilding a small object rather than a large disk is a far more efficient approach to maintaining data integrity." Another alternative is moving to SSDs, which have no moving parts and eliminate the potential for mechanical-related failures. P

Action Plan

Pinpoint problems. Use RAID, quality drives and configurations, and monitoring tools to pinpoint degrading performance, errors, and symptoms of failures.

Determine what's normal. Ensure a baseline denoting normal drive performance is available from which to draw comparisons.

Isolate the cause. If encountering full-blown drive failures, isolate or contain the cause.

Back up. Have good backups for storage systems and devices in place; if using snapshots, keep them elsewhere to avoid a single point of failure.

Automate rebuild. Use RAID systems that can provide automated rebuild procedures.

Follow the instructions. Follow vendors' recommended instructions for recovery, rebuilding, and other procedures.

Top Tips

Check with vendors. Vendors should be able to remotely access and notify customers about potential problems before something goes wrong, says Greg Schulz, senior advisory analyst at Server and StorageIO. Vendors should also have self-repair and self-healing capabilities with hot spares; automatic rebuilds or copies; and background integrity checks, cleans, and fixes.

Ensure encryption. Schulz says to ensure that drives are encrypted so that if you need to replace one, important or sensitive data doesn't go missing.

Have a secondary system available. Mike Karp, principal analyst at Ptak Associates, says the "key issue here isn't to fix the devices but to make the data available to users. Thus, have a secondary system available and make sure that every backup you do is readable." Ensure backups are easily accessible so recoveries can be done quickly and cheaply as circumstances allow, he says.

Avoid Common Issues With Unified Communications

Consider The Needs Of Your Employees & Plan Ahead To Prevent Potential Problems

Unified communications (UC) solutions cover a wide range of technologies, including telephony and desktop clients, videoconferencing, instant messaging, and mobile applications.

When implemented correctly, UC can provide a big boost to productivity and collaboration inside organizations, but a poor UC implementation can lead to low employee adoption and wasted investment. Before you think about whether employees will actually use your UC solution, you have to make sure your IT department is capable of deploying and supporting it.

Encourage IT Teamwork

"Unified communications ends up spanning a couple different disciplines just within IT," says Art Schoeller, principal analyst at Forrester Research. Before you worry about other departments throughout the organization, you have to make sure your telecom voice group, networking team, and desktop and collaboration teams, which all have different mindsets, are able to come together and agree on one suite of products or separate products that integrate well together.

Schoeller calls this is the "UC civil war" and says it stems from a period in time where there were clear vendor winners in different unified communication segments. Now, he says, each vendor has a more complete suite, which can add a degree of overlap to a company's overall UC approach.

The key is to pick the right solutions use case and not solely focus on remaining loyal to one brand over another. You also have to understand that even though one company has a foothold in a certain communications market, it doesn't mean that a primarily instant messaging company, for instance, can't provide a solid and reliable web conferencing experience as well.

Bern Elliot, vice president and distinguished analyst at Gartner, adds that IT teams need to understand their expertise levels and focuses in order to help each other provide the best possible UC experience.

"Someone who's used to the web conferencing part might not be aware of the telephoning part," says Elliot. "Or if it's a telephony person who's responsible, they may not be aware of the importance around the directory integration and log-on or the desktop and laptop integrations that will be required."

Drive Employee Adoption

Once the IT department has removed any internal disconnects, it can start figuring out how to make sure users actually take advantage of the UC implementation and provide a solid user experience, Schoeller says.

"Driving adoption is sort of a sticky problem because a lot of IT organizations don't view their role as being the one that really gets out there to track utilization and train users," says Schoeller. "In fact, our survey data a lot of time shows that one of the leading issues is that a lot of users aren't on the system, or to a certain extent, aren't aware of it. If you build it, will they come? No, you have to actually go out there and get them on it."

Get Started

"Develop a vision of where you want to go in four to five years and build toward it," says Bern Elliot, vice president and distinguished analyst at Gartner. "A large organization is going to take three to five years anyway just to work their way through a deployment because they have expensive equipment they can't just write off. It's more of a journey and continuous evolution. Smaller companies are more able to pick a solution, because they're at end-of-life on a platform and can implement something new entirely. Both need to pick a vendor that's strong and will work with them well."

Key Points

- Make sure your IT teams use their specific expertise to help each other and improve the overall UC implementation.
- Encourage employee adoption by focusing on their specific needs first.
- Unified communications solutions can bring down your network and introduce organizational challenges if you don't prepare ahead of time.

One way to encourage UC adoption is to use collaboration champions within your organization to show how UC can be used to improve productivity between departments. Though perhaps the best way to make employees aware of the UC system and actually use it is to tailor it to their needs so much that they simply can't avoid it. This requires you to understand your employees and their roles within the organization.

Although there is a lot of hype around mobility in that we think everybody is traveling and on a mobile device, Schoeller says, Forrester survey data shows there are still plenty of people who use phones. "There's a certain persona that's more of a desk-oriented worker who spends 60 or 70% of their time in the office. A payload of UC capabilities for that worker would be different than those for the road warrior who's on the road 70 or 80% of the time," he says.

Prepare For Technical & Organizational Challenges

When it comes to the technological ramifications of unified communications, there are some challenges IT needs to be aware of. For instance, UC will be a big burden on the network, so if you haven't done the right network design from a quality of service perspective, Schoeller says, users might think the applications aren't working when, in fact, you simply don't have enough Internet resources. To help with this, he recommends reaching out for help from a service provider or vendor to make sure you have the requirements to run any given UC solution.

Elliot says that while there certainly are technical issues to pay attention to, the organizational challenges are often more difficult. It's more than the IT department getting out of its comfort zone to become UC marketers in a sense to drive up adoption; it's also training employee to deal with a new way of getting work done and a different form of interaction, Elliot says.

The closer you can get to a seamless experience where every UC solution simply works, the more successful your implementation will be in terms of employee support and adoption. P

Action Plan

Think ahead. Make sure that the unified communications system you put in place will not only serve your current needs, but also your needs three to five years in the future.

Focus on employees. If you don't consider how employees will actually use UC solutions in their day-to-day lives and seek out features and functions that will excite them, it will be more difficult to encourage adoption and you may end up with an expensive, underutilized implementation.

Know your IT roles. Don't deploy UC solutions in silos, but instead have all of your IT teams work together to put the best possible solution in place and prevent potential integration challenges.

Prepare your infrastructure. Your unified communications system will impact your network, especially if you plan to use high-quality voice and videoconferencing solutions. Plan ahead and make sure necessary resources will be available.

Top Tips

Ensure the solution works right for your employees. Bern Elliot, vice president and distinguished analyst at Gartner, says you can't just look at a solution's feature set and check a box on your requirements list. The solution may claim to have a certain feature, but then when you implement it, it might not do the function the way you want, Elliot says. "It's important to look at features and functions, but it's also important you do it based on what people are actually going to need now and in the future, and to also look at the way that the function is accomplished."

Traditional UC is disappearing. According to Art Schoeller, principal analyst at Forrester Research, the way we view unified communications today is "in the throes of disappearing." He says "the backend systems for voice calls, video calls, web conferencing, and instant messaging are still there, but the application and explicit user interface to drive those starts to live within." This is important to remember from an adoption perspective, because employees will now be able to go to one application such as email and have multiple UC plug-ins at their fingertips.

Clean & Maintain Data Center Flooring

The Proper Approach & Techniques Can Make All The Difference

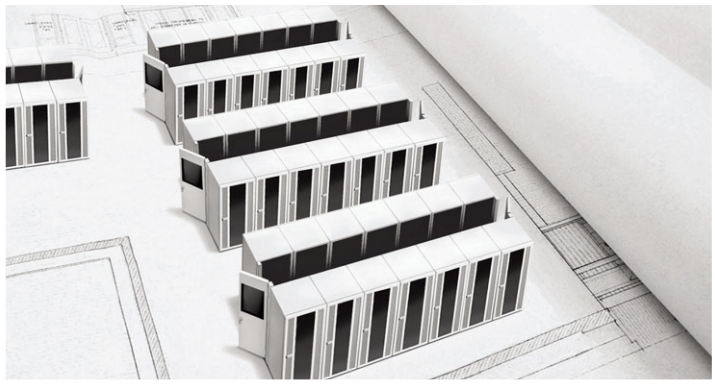
Typically, cleaning and maintenance are good things. This is certainly true of data center flooring, where dust and other contaminants can collect and do damage. But there is a caveat: In data centers, it's especially imperative that cleaning and maintenance is done properly. The wrong cleaning techniques and materials, for example, can actually do long-term damage. In fact, while cleaning floors may seem simple enough, it can pay to let professionals handle certain tasks. Here are some tips for maintaining and cleaning data center flooring.

Make Cleaning Important

Many data center managers feel that assigning a cleaning crew will cause downtime. As a result, they may not perform flooring maintenance as frequently as they should, says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

"In actuality, though, floor maintenance doesn't necessarily cause any downtime at all," she says. "While it's recommended that it be conducted when traffic within the center is at a minimum, keeping equipment live during maintenance is typically not a concern."

Routine flooring maintenance is actually critical to sustaining an ideal environment for electronic equipment, as clean flooring "can actually extend the life of your equipment and reduce the downtime that can occur as a result of dust and dirt accumulation," she says.



Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says cost can also play a role in regular flooring maintenance. Plus, he says, "there's a risk involved in performing this job. You must ensure whoever is doing this task fully understands the ramifications that can occur if not properly trained, supervised, and being extremely careful while working around the cables below the raised floor."

What & How To Clean

In addition to using a good vacuum with a HEPA filter to clean raised flooring, Koty advises cleaning all perforated tiles at least once a year. Koty has found through experience that removing and cleaning perforated tiles outside the raised floor area with a pressure washer does a great job of removing embedded dirt. Dry the tiles in a clean, sunny place and have spare tiles to replace the dirty ones you're removing so you don't interrupt the airflow design.

Viars says standard flooring maintenance includes frequent vacuuming, including under racks, as well as damp-wiping other data center surfaces such as cabinets and work surfaces that can collect dust.

"In raised floor environments, cleaning of the subfloor plenum is definitely a basic; however, it's usually not done too frequently," she says. Viars recommends having a preventive maintenance schedule with the frequency of various tasks dependent on the data center's size, amount of traffic, and other factors.

Generally, maintenance of subflooring in data centers with raised flooring is recommended at least once yearly

Get Physical

The data center flooring's physical attributes can help determine the cleaning approach that's best. Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says to ensure, for example, floor tiles aren't wrapped in sheet metal, as a galvanized coating can lead to zinc whiskers. Purchasing tiles that aren't wrapped in sheet metal eliminates this problem and the need for inspecting and cleaning, he says.

Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says to never apply wax to high-pressure laminate raised floor surfaces. Instead, use approved antistatic finishes. Certain tiles, including vinyl composition tile, should be stripped and refinished periodically, she says. Vacuuming is the recommended dry cleaning method regardless of flooring, she says.

with tasks such as vacuuming dust and other contaminants to ensure air being brought into the data center is as clean as possible. Floor surfaces should get a basic dry cleaning (vacuuming) weekly and damp cleaning at least quarterly.

Cover The Basics

For Koty, data center flooring maintenance begins with preventive maintenance, specifically "keeping contaminants out of the data center in the first place." Keep doors closed at all times; limit access to necessary and authorized personnel; use contamination control mats at all entrances, particularly anti-static mats that dissipate static electricity; don't allow food or drink in the data center; don't unpack or assemble items in the data center; don't store paper, cardboard, or similar supplies that may shed and collect contaminants; perform work outside the data center; ensure any tools and equipment that do enter are clean; and replace any floor tiles showing excessive wear.

Do This, Not That

Though many companies have their in-house janitorial staff clean data center flooring, Viars says it's worth considering using a professional to ensure flooring and equipment are cleaned with proper chemicals and methods and to prevent untimely degradation or unwanted contaminants.

As for technique, don't sweep flooring as it only makes dirt particles airborne and pushes them into panel cracks and through cable cutouts, Koty says. If using a mop, ensure that floor tiles are vacuumed prior to mopping. Always use a clean mop dedicated only to data center use, and ensure chemicals used are approved for data center use.

In addition, he says, be sure to wipe rack tops and the insides of cabinets with lightly dampened, clean disposable cloths; empty vacuum cleaners and other equipment outside the data center; only plug vacuums and other cleaning equipment into maintenance outlets (not server outlets); instruct anyone performing cleaning which outlets to use and why; inspect flooring surfaces for irregularities that suggest other problems (a black dusty coating can signal worn or misaligned A/C fan belts, for example); and if using cement-filled tiles, ensure cut edges are coated with a sealant to avoid dust coming off the cut edges. P

Use Caution With Chemicals

Damp cleaning of data center flooring and applying certain finishing techniques are typically better left to professionals, says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). Depending on the flooring, specific chemicals and solutions should or shouldn't be used.

"Allow a data center cleaning professional to apply all chemical substances or at least evaluate your center and advise you on what types of chemicals should be used for your flooring," she says. Vacuuming is generally simple enough, she says, but there is a science to how many floor tiles should be removed at once to prevent airflow and overheating problems.

BONUS TIPS:

Hire A Pro

Depending on a data center's size, flooring maintenance can be a cumbersome job for data center personnel, says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). Many managers, she says, "are already doing the right thing by contracting professional data center cleaning specialists, even if the sole motivation is convenience." A specialist will be familiar with short-term and long-term benefits and hazards of using different finishes and cleaners, she says.

Follow This Schedule

Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com) recommends cleaning flooring and equipment surfaces at least quarterly and cleaning the subfloor plenum at least yearly. Change air-handler filters every three months or more frequently when a data center comes online or if you suspect the environment is especially dirty. "A newly constructed or recently renovated data center environment will be especially dirty and will require more frequent cleaning," Koty says.

Be Better Aware Of Potential Environmental Issues

Focus On The Right Areas To Gain Better Control Of Your Data Center

Environmental issues such as cooling, airflow, heat, water, and humidity are a constant source of stress for data center managers, largely because the data center's fate depends on managers intelligently addressing the issues.

Matt Regalado, critical environment specialist at Simplex Isolation Systems (909/429-0117; www.simplexstripdoors.com), says many mistakes can be solved "with a holistic approach and a look toward the future," by planning for a "balance of growth, capacity, environmental responsibility, power, and cooling efficiency" and realizing that "everything in a data center affects everything else." Here is advice for gaining control of your data center environment.

The Rack, Not The Room

Often, says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), managers use environmental monitoring solutions at the room level, not the rack level.

The most common environmental concern is equipment overheating. Without a monitoring system within a cabinet to detect and alert for rising temperatures, by the time an ambient monitoring system detects a temperature change, equipment inside the rack could have sustained damage, she says.

Because heat is a big concern, many managers neglect humidity issues, she says. "The humidity levels within the data center need to be just right," Viars says. If they're too low, the possibility of electrostatic discharge is more likely. If they're too high, condensation can form and damage equipment, she says.

Generally, monitoring-related mistakes stem from attempts to reduce costs, as it's cheaper to monitor the ambient environment than monitor at the rack level, Viars says. Additionally, some personnel don't fully understand how to use monitoring equipment, meaning alarms may not be set properly or at all. "A smaller amount of issues can arise from misplaced sensors or faulty equipment, so it's important to test your monitoring equipment from time to time," Viars says.

Make It A Priority

Bob Douglass, vice president of sales and marketing at Sensaphone (877/373-2700; www.sensaphone.com), says the biggest mistake data center managers make is not giving environmental monitoring a high priority until there's a problem. Although the popularity of environmental monitoring has grown rapidly, he says, it's "still common for companies to put off the spending until after they have a problem."

Another mistake is using low-cost sensors or solutions dependent on servers or computers to function. "Standalone solutions are typically much more reliable," he says. Usually, limited budgets or misunderstandings about the potential high cost of monitoring factor in to using less preferable solutions, he says.

Although awareness is improving, "I don't believe everyone fully understands the dual nature of monitoring the environment," Douglass says. Although monitoring seems a first priority, watching for trends and potential energy savings is just starting to become more widespread, he says.

Factor In Expansion

Regalado says leaders commonly plan data center operations according to what's required right now without a serious, realistic forecast of what they'll need years out, This approach creates challenges and costs (power, cooling, and other

Be Willing To Spend

Don't attempt to skirt costs by implementing or maintaining an environmental monitoring system that doesn't cover all the bases, says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). A good, comprehensive system lets you keep tabs on temperature and humidity and issues alerts concerning abnormal conditions such as leaks, smoke, motion, power, and cabinet/room access. Once in place, make sure you understand how to use the system properly, she says. Manufacturer representatives, training videos, and literature can help educate about all the system's settings and reporting capabilities, she says.

infrastructure retrofits) later that proper planning could have helped avoid. As a result, some enterprises end up with a second or even third data center in other building areas, duplicating efforts and costs. "Depending on your situation, it's far less expensive to cool a larger space as opposed to cooling two or three smaller spaces."

Beyond talking to contemporaries about their experiences, Regalado cautions against taking an "I did it this way at my other company" mindset or leaving a design entirely up to an architect that isn't completely versed in data center design. Include all environmental facets in planning—not just cooling, but power needs, cable management, fire suppression, and ergonomics.

Also, don't over-engineer one facet but neglect others. For example, don't include 16 AC units but no containment, he says. "If they contained the data center, they could quite possibly achieve the same results at less cost initially and certainly less ongoing costs in terms of energy," he says.

Future Environmental Issues

Regalado says data centers will move from being controlled environments to critical environments in terms of controlling hot and cold air and limiting dust, dirt, and contamination.

Data centers will be "more like a cleanroom" in which particles are controlled and have a dedicated HVAC with HEPA filtration, he says. "They'll also be cleaned more, perhaps quarterly or more often. Personnel will wear lab coats and booties," he says. "We're already seeing the beginnings of this." Beyond negatively affecting equipment performance, dust and dirt insulate interior components and interfere with airflow, meaning rising temperatures within racks.

Maintaining a clean data center means better airflow and cooler processors, he says. "You can add capacity to your data center without expanding the footprint or increasing cooling needs, so you save on energy," Regalado says. Just opening cardboard boxes in the data center introduces particulates. "If you have foam packing materials, you've doubled the contamination," he says. P

Spend Up Front

If your budget allows, computational fluid dynamics can help create a computerized version of a data center on which you can add and subtract computers, increase cooling, expand the footprint, and create a model to indicate "how those things will affect the data center," says Matt Regalado, critical environment specialist at Simplex Isolation Systems (909/429-0117; www.simplexstripdoors.com). A more affordable monitoring possibility is using digital thermometers on cabinets (top, middle, and bottom) to record inlet and outlet temperatures, he says.

BONUS TIPS:

Hear The Call

Because many problems occur at night, Bob Douglass, vice president of sales and marketing at Sensaphone (877/373-2700; www.sensaphone.com), says to make sure your monitoring system can wake you up. A primary motivator for acquiring a monitoring system is to know when there's a problem as soon as possible, he says. Text messages and email alerts are great during the day but may not get you out of bed at night. "Nothing beats a good old-fashioned phone call to let you know about a problem," he says. "To maximize your instant notification, pick a system that can call and talk to you." Look for systems with a voice message feature that can accurately describe current conditions and which sensor tripped.

Don't Forget Water, Power

Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says although a flash flood in the data center isn't likely, chiller/CRAC line leaks are a concern. Place water sensors inside and outside racks, generally at lower points to alert if a water line breaks or condensation accumulates from high humidity. Power monitoring is also essential, says Sensaphone's Douglass. "Everyone relies on UPS systems for power problems, but not everyone thinks to monitor the UPS system itself." Incorporate power monitoring with other environmental sensing and ensure the system has built-in, independent battery backup and "hopefully an out-of-band communication option."

Avoid Common Mistakes With Cloud Computing

Watching For These Potential Pitfalls Will Ensure You Get The Most From Your Service

Many companies have only recently started to consider moving major systems and applications to the cloud. While cloud computing can provide many performance and cost-saving benefits, it can also lead to major problems. The key is to understand what to expect from cloud computing, communicate with service providers, and avoid the pitfalls that many companies fall into during the implementation and integration process.

Misunderstanding The Cloud

Companies do not always fully understand what to expect from a cloud service and the provider. "It comes down to a misunderstanding of what cloud is, which is dangerous," says James Staten, vice president and principal analyst at Forrester Research. "If you assume the cloud is just like hosting, then you assume you get a high SLA, a stable environment, a machine to yourself, and all the characteristics that might be very familiar to you as what's running in your data center. But that's very different than what cloud actually offers."To further complicate the issue, some providers dabble in cloud washing, which means they rebrand or remarket their existing services as cloud solutions, even if they don't hold up to the true definition of the cloud.

John Sloan, lead research analyst at Info-Tech Research Group, says the key to determining whether a company truly provides the cloud or is "washing" its services is to look for "elasticity of the service" and the ability to "only pay for what you're using."

Too often companies assume that as long as a service is hosted somewhere else or an application is running outside of the organization, then "it must be in the cloud," Sloan says. This can be a problem for companies looking to invest in true cloud computing and needing the agility and elasticity that it provides.

"If you're really looking for the NIST definition of the cloud, and if that's what you're buying, then you want to make sure that's what you're getting," Sloan says.

Integration Issues

It can be difficult to integrate cloud computing with your established systems and processes. Sloan breaks these integration issues into three categories: data, application, and access and identity.

With data integration, some companies move an application to the cloud with many short-term benefits, only to discover that "there's key data living in that application in the cloud that is now in a silo away from your other data," Sloan says. This leads to fragmentation because "you don't have a single view of the truth," he says.

Application integration involves the interaction between multiple applications, both housed inside the company and located in the cloud. "To improve business processes within the organization, you want something that happens in one application to trigger something to happen in another," Sloan says. "And if your applications are scattered among a mix of internal and external providers, it can become problematic."

Integration issues surrounding access and identity can result in security vulnerabilities for the company if not handled correctly. For instance, if an employee

Know Where Vendor Responsibilities End

John Sloan, lead research analyst at Info-Tech Research Group, stresses that companies need to understand that with cloud computing, there is a shared responsibility. It's your job as the customer to communicate with the vendor to determine where your responsibilities start and where the vendor responsibilities end. Otherwise, you could end up in a sticky situation with no clear resolution.

"In terms of service management, if there's a problem, what are the lines of communication and how do things get moved back and forth?," Sloan says. "Often, the SLA or contract will just focus on the vendor's availability target and states that you'll get usage credit if they don't meet it, and that's all fine, but it's not very operational and it doesn't answer the question of, 'What if something goes wrong?'"

were to leave the company, there would be a process for removing them from the internal system and blocking off access to sensitive information. But if that same employee has access to data in the cloud, the process may not be the same, according to Sloan.

With application and data integration, it comes down to testing your applications and links in the cloud before you implement them.

Picking The Wrong Applications

Some applications are simply not a fit for the cloud. If you pick an application that is "annoying or difficult to run in-house, it's actually going to run much worse in the cloud," Staten says. He recommends moving apps that are designed to scale out, such as websites, collaboration apps, and high-performance computing apps. Also, instead of moving one big application, you should move apps that are "designed in a Web services fashion, meaning they are composed of several small applications that interoperate."

Sloan recommends companies use a "value vs. readiness" approach to making the decision. For instance, you may have a workload that would be easy to move to the cloud, but you already have so much infrastructure built for it that the move wouldn't actually save you money. Or you may have a solution that would be difficult to move to the cloud but may lead to long-term cost-related benefits if you could do it. Sloan says to look at each application and determine if a migration to the cloud would lead to a higher ROI.

Choosing Between Cloud Platform & SaaS

Be aware of the unique benefits of cloud platforms and software-as-a-service offerings to make sure you end up with a true fit. For instance, if you are interested in using custom applications, then a cloud platform may be a fit. But if you want to move existing commodity-class applications to the cloud, in some cases you can do so "with a higher cost value than with an in-house equivalent," Staten says.

If you opt for a cloud platform, you have to make sure that your team is skilled enough to use a cloud platform, understands the right languages, and is aware of the configuration challenges, Staten says.

SaaS has its own problems. Staten says that companies will sometimes customize a commodity application to the point that they "can't take advantage of the new features and capabilities that the SaaS provider gives them." To help solve this problem, Staten says that companies should change their business processes to better fit the application rather than customize the application to fit potentially flawed processes. Matching your processes to what the SaaS application does is the best way to keep costs low and efficiency high, Staten says.

Public vs. Private Cloud

Adding to the confusion surrounding the cloud is the need to assess the differences between public and private and whether private clouds even constitute true cloud computing.

According to John Sloan, lead research analyst at Info-Tech Research Group, most private environments don't possess the pay-per-use and elasticity features outlined in the NIST definition for cloud computing. But for some companies, a private cloud may be a better fit for them than true public cloud alternatives in the short-term. "The perception is that for certain workloads and applications, the public cloud is not ready to host our stuff, but where is it going?" Sloan says. "Is the private cloud the final solution or is it just what we can do today? Maybe as the public cloud matures, more can be moved to the public cloud."

BONUS TIPS:

Go With The Crowd

"Trying to find the cloud that's specifically right for you can sometimes mean that you're in a difficult situation," says James Staten, vice president and principal analyst at Forrester Research. "You may be working with a cloud provider that is so dependent on your business that they'll bend over backward for you, but if they can't land a second or third customer, they could go out of business."

Don't Overreact On Security

"A lot of companies think they have to have the security of the cloud customized specifically to their needs, and they need encryption everywhere in every volume. But that's just not true," Staten says. "There's a lot of security that is done by the cloud that is perfectly fine, and you don't need to supplement or add anything to it."

When Software Licenses & Cloud Computing Collide

How To Address The Challenges Posed

Cloud Computing has opened up scads of opportunities, use cases, and potential benefits to enterprises and is effectively reshaping how many companies do business. That doesn't mean the cloud doesn't come without a fair number of challenges that enterprises must address, however. This includes issues concerning how cloud computing changes the traditional means in which enterprises license software. The following details such changes and offers advice for how to address them.

Identify The Challenges

Sandi Conrad, Info-Tech Research Group senior consulting analyst, says the biggest challenge cloud computing creates related to software licensing is adding "the complication of yet another series of licensing methodologies." Unlike traditional software licensing, in which software is installed and tools help identify and manage it, working with cloud providers means relying on them to provide appropriate reporting, Conrad says.

On the positive side, this means enterprises receive reports based on actual usage and are less likely to encounter piracy situations. Licensing, however, does get more complicated, partly because "it's not always clear who's responsible for buying licenses or, if you have licenses in place, you can use them in a hosted environment," she says. For example, enterprises must balance both the cloud and software provider's contracts if using an infrastructure-as-as-service (IaaS) provider.

Holger Mueller, principal analyst and vice president at Constellation Research, says, "mostly, licensing changes from ownership on-premises to renting in the cloud." This can be an attraction and hindrance because it's difficult to convert on-premises licenses to cloud licenses, he says. Recently, some vendors have started converting unused on-premises licenses to cloud licenses, which is one way to create value for the vendor and the customer, he says.

Differentiate The Models

Mueller says software vendors that use an on-premises business model have traditionally been reluctant to address cloud licensing. "Their stock market evaluation depends too much on traditional on-premises license revenue," he says. He cites one vendor of enterprise software that moved to a cloud model "and their valuation took a long hit."

Conversely, vendors that started in the SaaS and IaaS age "have the advantage of disruption on their side, as well as favorable stock market evaluations," he says. Moving forward, Mueller foresees a general trend to usage-based pricing, though traditional vendors are reluctant to start or embrace this.

When looking at licensing from a cloud perspective, Conrad says private clouds are a bit simpler in that enterprises essentially run their own data center and still have control of licenses, just in "more of a virtual environment." Here, licensing terms tend to be fairly well-defined with software publishers, she says.

Negotiate When Possible

While some cloud providers add terms to contracts that limit their liability, the client's ability to retrieve data, and some services so that they'll cost extra or aren't available at all when needed, other providers have very reasonable contracts with certain areas being negotiable, says Info-Tech Research Group Senior Consulting Analyst Sandi Conrad. Negotiable items might include services pertaining to the management of an enterprise's application, tech support, providing patches and security for an OS, and development assistant. Enterprises should know what's included in a contract, services they're responsible for, and what it will cost to access vendor-provided services, she says.

Typical SaaS environments also tend to be simpler because they're usually based on a per-user model, though add-ons can be involved. With IaaS, however, challenges and pricing can get more complicated because enterprises may have to deal with multiple contracts and vendors and will need to understand where liability and responsibility change as they combine those different solutions.

Still, Conrad says, "you're paying for what you're using. You're not forecasting, 'Well, we think we're going to use this amount.'"

Closely Review Contracts

Many cloud vendors do "some very interesting things" in their contracts, Conrad says, including limiting various liabilities, requiring 100% payment up front, and providing clients no real reimbursement opportunity if the provider fails to meet SLAs. Liability is so limited in some instances, she says, CIOs should carefully review and understand contracts to determine any danger involved in retrieving data, ensuring business continuity, and the like.

"There's a lot of detail above and beyond the licensing they need to look at," she says. Enterprises should take caution, for example, that if they must change cloud vendors quickly, they know the liabilities involved with accessing their data. If an enterprise can't access its data for, say, a week, "no amount of penalty is going to change the fact that you can't do business, so all those factors have to play into the contract," she says.

Look Forward

Mueller recommends enterprises determine their current and future loads. "The more stable these are, the more options they have and the more likely on-premises will be a viable option," he says.

Conversely, the more flexible loads are, the more interesting IaaS will be. Enterprises should also check with vendors they already use (such as for virtualization) that know their loads, he says.

For SaaS situations, Mueller says to determine the strategic importance of all enterprise automation assets. "One of the underrepresented side effects of moving to the cloud with SaaS is that most competitive differentiation from enterprise software dissipates," Mueller says. "All clients use more or less the same software and are on the same release at the same time, so determine the strategic importance. For enterprise automation areas that look more commoditized to your company, look at the SaaS offerings." P

Double-Check All Deals

Info-Tech Research Group Senior Consulting Analyst Sandi Conrad says to ensure software contracts clearly define who's responsible for licensing. "If an offer seems too good to be true or very unique, dig in a little bit deeper," she says. Recently, Conrad says an Info-Tech client was offered a "phenomenal deal" from a cloud vendor for a service offering for a certain OS. The offer was ultimately found not to be a legitimate licensing deal, and the company eventually shut down. "If they're offering another vendor's licensing at a very low price, check in with that vendor and see if it's legit," she says.

BONUS TIPS:

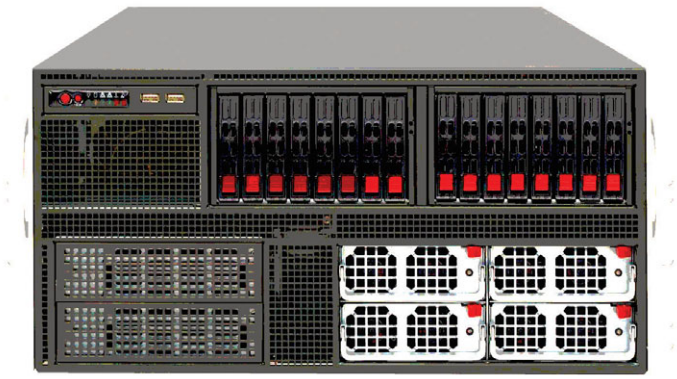
Access The Costs

Holger Mueller, Constellation Research principal analyst and vice president, says cloud usage represents a fundamental change in licensing from possessing ownership to essentially renting. If a software vendor offers on-premises and cloud choices, assess the implementation and operating costs of both options. "The cloud will not always be the cheapest solution, especially if requirements and user load are stable," he says. For example, the case for cloud deployment and licensing isn't always obvious for finance and manufacturing deployments, he says.

Double Up

Depending on how specialized a cloud vendor is, some items can be written into a contract, says Info-Tech Research Group Senior Consulting Analyst Sandi Conrad. One example is writing into the contract that you need the ability to have a replica of an application locally hosted so that if you must flip the switch if something happens to that provider, your location isn't affected. Conrad says being able to switch to a locally stored application is a huge business-continuity benefit, but enterprises may have to push a vendor to allow that ability.

Buying Tips:
Servers



When buying a new server, you have to know much more than just your enterprise's current and future needs. Budgets, compatibility, and vendor considerations also come into play.

Above all, you need to understand when it's time to buy new servers. As with any IT purchase, the goal should always be to invest in a solution that will meet performance needs for years to come.

Determine Features You Need

Charles King, president and principal analyst at Pund-IT, says CPUs, memory, and I/O are the most critical server features, though their relative importance depends on the application and workload. Companies running a business-critical database or online transaction program, for example, should eye a higher-end CPU/system than what's needed for general-purpose applications. For virtualization-related use, spend more for extra memory and I/O.

Mark Bowker, Enterprise Strategy Group senior analyst, says that too often, buyers purchase a server with more capacity than needed, which provides the comfort of extra headroom but adds expense. At the same time, though, you want to future-proof your investment as much as possible by looking for efficient, power-saving servers that can help lower energy costs in the short and long term.

"IT should understand what the latest processor chipset is on the market and what the stated road map of the chip manufacturers are," Bowker says. "This will help avoid buying into servers that are at the end of a product life cycle."

Tau Leng, Ph.D., vice president and general manager of corporate marketing and HPC solutions at Supermicro (408/503-8000; www.supermicro.com), says today's server systems are available with a variety of processor technologies and form factors. "Customers often purchase equipment that is overdesigned with unnecessary features," he says, which is why it's essential you work with an experienced and reliable partner that can offer a variety of solutions.

In addition, Leng says, adherence to standard rack unit is important to allow for easy interchange of servers. Remote management features also are critical, and power savings is becoming an important element in TCO determinations.

Consider Your Budget & The Total Cost Of Ownership

Before you get started with a server upgrade or replacement, be sure to carefully plan your budget. Don't forget that the total cost of ownership includes many different items beyond just the upfront server cost.

Possible expenditures include equipment, software licensing, labor, telco and power company services, facility improvements, vendor support, and downtime. Additional costs related to supporting a new platform can include those for power, network cabling, cooling, rack space, and management personnel, he says.

"In any infrastructure purchase, the upfront capital acquisition cost is just part of the deal. Three- to five-year total costs should be calculated, including maintenance and facilities costs," says John Sloan, lead analyst for virtualization and consolidation at Info-Tech Research Group.

Watch For Trends

Leng says one relatively new trend in servers is high-temperature free-air-cooled server environments, which can reduce electricity demand and rein in costs.

Virtualization and consolidation are also having an impact. Sloan says it's important to know how a server will fit into a consolidated stack that includes servers, networks, and storage.

Unlike distributed models, Sloan says, "in a consolidated infrastructure, the server is a unit of hard capacity (processing and memory) that's combined with networks and storage in a resource pool that's partitioned up into virtual entities." Increasingly, he says, enterprises aren't buying servers, but blocks of capacity.

What differentiates current offerings "is how the interconnects are managed and how the whole thing is managed as one resource pool," Sloan says. Typically, blade servers are the form factor for consolidated offerings, he says. P

Checklist

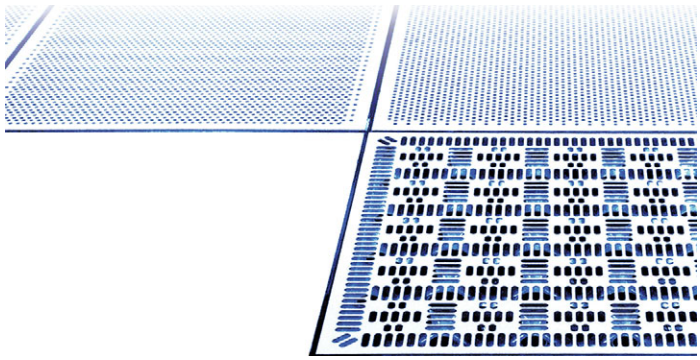
Match needs, requirements. Make sure the application and workload the server will support aligns with the CPU, memory, I/O, storage, and other components you plan to purchase.

Spot upcoming trends and know how you'll use them. Virtualization, consolidation, and cloud computing are trending areas where servers are concerned. How will these trends impact your data center and the servers you purchase, both now and in the future?

Check your vendor. Ensure the vendor you plan to buy from satisfies all questions concerning support, compatibility, performance, and other issues.

Buying Tips:

Flooring & Accessories



Everyone knows that servers and power equipment are vital to a data center. But just as important is the flooring that holds them. Choosing the right flooring provides a stable, efficiently cooled data center. Here's what to look for.

Know The Weight

Raised floor tiles come in different weight capacities, so consider your weight-bearing requirements when selecting tiles, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com).

The final floor has to be strong enough to support your equipment at the height of the raised floor. Also be aware of rolling load and use heavy-duty floor tiles where you will be moving equipment into and out of the data center.

Remember as rack sizes grow and densities increase, your floor tiles may need to support a greater weight than you have today. Plan ahead and install floor tiles to meet current and future needs, Koty says.

Check The Floor Finish & Material

Be careful when selecting the floor finish, Koty says. "You don't want to be constantly replacing tiles in high-traffic areas to keep the floor looking uniform."

Avoid floor tiles wrapped in galvanized metal, Koty says, as the galvanized-wrapped tiles could cause zinc whiskers over time. If you are using cement-filled tiles, use a sealant to coat any cut edges of your tiles.

You'll also need to consider static dissipation and material weight, says Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

"Data center flooring needs to have a surface that is conducive of static dissipation," she says, to prevent the build-up of static electricity. In addition, she says, "lightweight solutions, as well as 'lay-down' panels rather than bolt-down ones, can make maintenance or swaps significantly easier."

Be Aware Of Cooling & Floor Height

If you can maximize the available space under the floor, you can increase your data center's overall cooling efficiency. As for the height of the floor, there are some general standards to follow, Koty says:

- 12 inches for less than 1,000 square feet
- 12 to 18 inches for 1,000 to 5,000 square feet
- 24 to 36 inches for 5,000 or more square feet

Koty says if you want your flooring to accommodate a hot/cold aisle configuration, make sure to plan your under-floor cable layout according to CRAC and PDU/RPP unit locations.

Cable management is also essential. "It's important to plan your under-floor power cabling layout precisely, establishing designated cable pathways," Koty says. "Making sure you purchase your power cables to the proper length will help to limit congestion and minimize air dams that can lead to cooling inefficiencies."

Check Vendor Experience

If your company doesn't have anyone on staff with experience in data center flooring, don't hesitate to rely on the expertise of a vendor. It can help you choose the right flooring and prevent the need for a potentially costly flooring replacement down the road.

Opt For Accessories

You may be tempted to cut corners to save money, but don't, Viars says. "Don't compromise on the integrity of your flooring. Make sure floor panels fit together as intended (even if it requires custom cutting/sizing), and spring for the additional airflow management accessories. It might cost a bit more upfront, but it will ensure that your cooling remains effective."

Koty says if you are planning a new raised floor construction job or a build-out, plan ahead and install brushed floor grommets as the floor tiles are being installed. "If you wait to install the grommets at the time the equipment is installed, you have fewer grommet options, plus there is the added risk of introducing contaminants into the data center." P

Checklist

Check the fit. Do the flooring panels fit your needs and allow for effective cable management?

Account for cabling. Is there enough open space under the floor for cable routing and cooling?

Know the vendor. Does your vendor have a stellar reputation and testimonials from past clients?

Measure the load. Are all sections of the data center flooring capable of handling the weight and traffic to which they will be subjected?

Buying Tips:

Equipment Recycling & Disposal Services

There's so much to deal with when it comes to old equipment. Can you reuse or repurpose it? Or do you need to just get rid of it? If that's the case, a vendor can help you ensure equipment is handled in an environmentally responsible manner while abiding by privacy and compliancy regulations. Here's what to look for.

Recycle vs. Resale

One of the first decisions to make is whether you want to recycle or resell equipment. "If the client has rooms full of retired IT, there are two strategies to consider: recycle or resell. If its junk from 1985, it would be a waste of time to pursue reselling the product. If its decent stuff from 2004, it's probably still worth thousands of dollars that could return capital to the budget," says Kyle Bittner, business development manager for Exit Technologies (239/596-2254; www.exittechnologies.com).

Recyclers, he says, focus on precious metals and waste material. IT asset managers focus on value and will often give you the best price for your equipment.

Compare Providers

When comparing service providers, examine what the services are offering, says Brett Femrite, director of business development for Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

"Some of the larger companies charge for asset disposal, while others will pay you for the equipment. Smaller regional companies can often provide more cost-effective solutions because of local transportation, labor, and processing," Femrite says.

"Ask for referrals, performance reports, or projections up front. Looking at past disposal lists will make it easy to forecast what you can expect," he says.

Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says you want a reputable company with a good track record. Find out how long the vendor has been in business and ask for (and check) a list of previous clients.

Check a provider's specialties, Bittner says. For example, if you're getting rid of telecom equipment, don't sell it to a consumer electronics reseller, he says. "They don't know the market as well on telecom, and they will offer a really low price."

Know Your Equipment & Needs

Be sure you understand your equipment and the capabilities of the recycling company.

"Can your equipment be recycled whole, or must it or parts of it be destroyed? How are you going to handle hard drives or other media devices? Are you going to remove them yourselves and destroy them prior to recycling, or is the service qualified to destroy them for you?," Koty says. Be sure any servers have all your data removed, he says, and consider pulling and destroying the data drives prior to recycling.

Check Facilities, Processes

Don't just look for the least expensive company, Koty says. He recommends visiting the firm and inspecting its procedures. Check what security and surveillance the vendor uses, how it can assist with ROI for current projects, and what documentation processes it uses.

Bittner says to find out how the hard drives and sensitive data will be handled. "It's important the product is responsibly handled, otherwise it can result in bad publicity for the company," he says.

Onsite Or Offsite?

With data destruction, you have two choices: onsite or offsite. With an onsite service, you won't have to deal with chain of custody. If your data center stores sensitive data and wants to physically destroy it, you'll have peace of mind from watching the destruction.

If you want absolute destruction, consider offsite data destruction as service providers typically have more powerful shredders at their facilities than mobile shredder services can offer, plus some offsite data destruction services also double as a reprocessing center that can remarket the parts, providing return value.

Checklist

Do your homework. Compile a list of equipment you no longer need, then determine its resale value, who might purchase the equipment, and how the resale value can help fund purchases.

Check for qualifications. Determine how long the prospective vendor has been in business, what its reputation is in the industry, and what compliancy and certification measures it operates by and has achieved.

Know the difference between a broker or provider. Determine if the vendor actually provides recycling and disposal services or is just a broker of such services.

Understand the process. Know how the vendor processes equipment, including who handles equipment, where it goes, how long processing takes, and what documentation you can expect.

Buying Tips:

Data Center Cooling

No matter what the temperature is outside, most data centers need at least some degree of cooling year round. Having cooling equipment that can keep up with demands is essential. Here are things to keep in mind.

Know Your Options

Are you building a new data center from the floor up or upgrading a current system? Are you looking for a permanent system or a portable air conditioner for short-term needs? These are all important questions to answer.

"When purchasing cooling equipment for your data center, you'll first want to determine what your current needs are, as well as your budget," says Laura Viars, account manager at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

The most popular options, according to Viars, include:

Basic air-cooled systems. These systems have a traditional CRAC unit and are ideal for standard-density arrangements.

Free-air cooling systems. These systems keep operational costs down by utilizing natural (or outside) air to cool the data center. However, they are not feasible in all locations.

Liquid cooling systems. These systems are more efficient and run quieter than other systems. However, the initial price tag, as well as upkeep costs, can be high.

Portable cooling units. Otherwise known as spot coolers, these systems are ideal for affordably solving a temporary cooling concern, such as seasonal temperature fluctuations.

In addition to these options, Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says you need to determine whether you'll be using computer room air conditioners (CRACs), which have self-contained compressors and require condenser water, or large central chillers that require computer room air handler (CRAH) units. "The different types of units have different needs and require different types of maintenance," he says.

Size The System

To understand how much cooling capacity you require, calculate the load that needs cooling and total tons of cooling, accounting for future growth, Koty says.

Determine how much heat your system will generate, Viars says, which includes not only the IT load, but also the power systems, lighting equipment, and the people working within the data center.

"Once that data has been collected and compiled, that number will need to be inflated to account for redundancy, the effects of humidification, and future growth of the data center," she says. "You do want to make sure that you have the required capacity available for growth and redundancy."

Koty says it's equally important to know the sensible and latent capacity the equipment will produce; manufacturers should provide documentation for these capacities.

Don't be surprised if you find your data center already has adequate cooling capacity for the equipment on the floor, Koty says. "A lot of data centers are designed with excess cooling capacity. Unfortunately, the excess capacity masks other cooling efficiency issues like airflow bypass, recirculation, and air stratification," he says. "As long as these other cooling inefficiencies exist, excessive energy consumption will continue."

Other Factors To Consider

Don't overlook details when comparing air-conditioning systems. Koty says to look for controls that can be monitored remotely and the ability to lock the control panel to prevent unauthorized personnel from changing temperature and humidity settings.

Koty says other important features include internal smoke detectors and liquid detectors that can be monitored remotely. Also consider maintenance. You should have easy access to perform tasks such as changing filters, cleaning coils, and replacing compressors and belts. P

Checklist

Calculate your load. "It's critical to calculate the amount of cooling that a rack or cabinet system will require prior to the equipment being put into production, though this is not always easy to determine," says Will Beene, rack specialist and technical account manager at RackSolutions (888/903-7225; www.racksolutions.com). "If available, look at the production loads going back six months to determine what the equipment is doing during a 24-hour cycle."

Know how many units you need. You shouldn't only buy enough units to handle your current load. Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says you need to account for future growth and the failure of a unit or the need to shut down a system for proper maintenance. The total CFM output of your units can also impact how many units you need, he says.

Network With Your Peers At These IT Training & Association Meetings Across The United States

JANUARY

AITP Washington D.C.

Jan. 9
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

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Configuring, Managing & Troubleshooting Exchange Server 2010

Jan. 20
New Horizons Washington, D.C.
1331 F St. N.W.
Suite 420
Washington, D.C.
www.dcnewhorizons.com

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AITP Long Island Networking & New Member Event

Jan. 23
5:30 to 8:30 p.m.
The Northport Yacht Club
11 Bluff Point Road
Northport, N.Y.
www.AITP-LI.org

Configuring & Managing SharePoint 2010

Jan. 27
New Horizons Tysons Corner
2010 Corporate Ridge, Suite 200
McLean, Va.
www.dcnewhorizons.com

FEBRUARY

BICSI Winter Conference

Feb. 2-6
Rosen Shingle Creek Resort
Orlando, Fla.
www.bicsi.org/winter

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AITP Washington D.C.

Feb. 13
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

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Cyber War 2014

Feb. 14
Train Ace Greenbelt
7833 Walker Drive, Suite 520 C
Greenbelt, Md.
www.trainace.com

Social Engineering & Manipulation

Feb. 24
Train Ace Greenbelt
7833 Walker Drive, Suite 520 C
Greenbelt, Md.
www.trainace.com

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Wearables DevCon

Feb. 25-27
San Francisco, Calif.
www.wearablesdevcon.com

MARCH

Interconnecting Cisco Network Devices 1

March 7
New Horizons Washington, D.C.
1331 F St. N.W., Suite 420
Washington, D.C.
www.dcnewhorizons.com

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AITP Washington D.C.

March 13
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Big Data TechCon
March 31-April 2
Boston, Mass.
www.bigdatatechcon.com

Implementing Cisco Intrusion Prevention System
March 17
New Horizons Tysons Corner
2010 Corporate Ridge, Suite 200
McLean, Va.
www.dcnewhorizons.com

Interop Las Vegas
March 30-April 4
Las Vegas, Nev.
www.interop.com/lasvegas

APRIL

2014 High Performance Computing Linux for Wall Street
April 7
Roosevelt Hotel
New York, N.Y.
www.flaggmgmt.com/linux

AITP Washington D.C.
April 10
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Configuring, Managing & Troubleshooting Exchange Server 2010
April 14
New Horizons Washington, D.C.
1331 F St. N.W., Suite 420
Washington, D.C.
www.dcnewhorizons.com

SharePoint TechCon
April 22-25
San Francisco, Calif.
www.sptechcon.com

Data Center World Spring
April 28-May 2
The Mirage
Las Vegas, Nev.
www.datacenterworld.com/spring

MAY

AITP Washington D.C.
May 8
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

AnDevCon Spring
May 27-30
Boston, Mass.
www.andevcon.com

JUNE

Configuring & Managing SharePoint 2010
June 9
New Horizons Tysons Corner
2010 Corporate Ridge, Suite 200
McLean, Va.
www.dcnewhorizons.com

AITP Washington D.C.
June 12
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Do you have an event you'd like to see listed?
Send an email to feedback@processor.com.

PROCESSOR Solutions Directory

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

Physical Infrastructure

RACKMOUNT SOLUTIONS

Rackmount Solutions' mission is to listen to the IT engineer's specific needs and deliver superb-quality, high-performance products through continuous product innovation and operational excellence. We pride ourselves in providing quality customer service, products that fit your IT requirements, and solid value for your money.

Products Sold:

- Wallmount and server racks and cabinets
- Desktop/tabletop portable racks
- Shockmount shipping cases
- Bulk cable

(866) 207-6631 | www.rackmountsolutions.net

Physical Infrastructure

Rack Solutions®

RackSolutions has been serving the data center market for more than 10 years. All of our products are designed, engineered, built, and shipped under our own roof. We have product solutions available for every major OEM, but if one of our existing products doesn't fit your needs, our top-notch mechanical and electrical engineers can create the item you need from scratch, solving even the toughest installation design challenges. Best of all, we typically don't charge up-front fees for design services.

Products Sold:

- Computer Server Racks
- Cabinets and Shelves
- Mounting Products

(888) 903-7225 | www.racksolutions.com

Physical Infrastructure

PDU Cables™
Innovator in data center efficiency

PDU Cables is the leading supplier of power distribution cables assemblies to data centers in North America. PDU Cables has been serving this industry since 1981 and is the first independent cable assembly company to introduce colored conduit into the power distribution cable market, the first to get UL 478 listing, and the first to introduce the Power Cable and Equipment Configurator software tool. The company is centrally located in Minneapolis, Minn., allowing it to offer 24-hour turnaround and shipping time of just one or two days to almost any United States destination.

Products Sold:

A range of power cables, cable seals, and power cord assemblies.

(866) 631-4238 | www.pducables.com

Physical Infrastructure

CABLESYS®

Cablesys, headquartered in La Mirada, California, is a leading manufacturer of high performance fiber cables, fiber jumpers, CAT 6 patch cords, CAT 5e patch cords, CAT 6 cables and connectivity solutions. We have millions in stock that can be shipped same day and best of all, 20% less than name brands.

Products Sold:

- Fiber Optic Cables
- Fiber Patch Cords
- Networking Patch Cords
- Telephone Line Cords
- Audio and Video Cables

Custom Cable Assemblies:

- Pre-bundled Cable Assemblies
- Trunk Cable Assemblies
- Multi-strand Cable Assemblies
- Pre-labeled and Pre-kitting
- OEM Cable Assemblies

(800) 555-7176 | Cablesys.com/pro

Physical Infrastructure

ITWatchDogs

ITWatchDogs manufactures environmental monitors that help prevent downtime from climate- and power-related issues. Its Web-enabled monitors let users keep an eye on remote conditions from a secure Web interface and receive SNMP, email, SMS, and voice call alerts when specified alarm thresholds are exceeded for external factors, including temperature, humidity, airflow, power failure, smoke, water detection, and more.

Products Sold:

- Climate monitors
- Power monitors
- Digital and analog sensors
- IP surveillance cameras

(512) 257-1462 | sales@itwatchdogs.com | www.itwatchdogs.com

Physical Infrastructure

BLACK BOX NETWORK SERVICES

Black Box is a leading technology product solutions provider that helps customers build, manage, optimize, and secure their networks. The company is a single source for cabling, cabinets and racks, localized cooling, power and surge protection, environmental monitoring, and more. Black Box also offers a best-price guarantee and FREE, live, 24/7 U.S.-based Tech Support.

Products Sold:

- Acoustic IT Enclosures
- Cabinets & Racks
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- Console Servers
- Cooling
- Datacom
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- Infrastructure Hardware
- KVM
- Networking
- Power
- Remote Monitoring

(877) 877-2269 | www.blackbox.com

Physical Infrastructure

hergo® TECHNICAL WORKSPACE SOLUTIONS

Based in New York City, Hergo Ergonomic Support Systems is an independent designer and manufacturer of enclosure cabinet solutions, technical computer furniture, and modular racking systems. The company's products are designed to promote organization in the workspace and to increase the productivity of computers, peripherals, and communications equipment. Hergo is known for its high-quality products and superior customer service.

Products Sold:

- Racks
- Enclosures/cabinets
- Motorized workstations
- Flat-panel arms
- Computer desks
- Cable management
- Power management

(888) 222-7270 | www.hergo.com

Physical Infrastructure

LINDY® CONNECTION PERFECTION

LINDY USA specializes in cables, adapters, electronics, and accessories for computer, networking, and audio video applications. Since 1932, Lindy has supplied high-quality interconnects to customers in commercial, telecom, and residential markets. What sets us apart is our complete dedication to innovation, performance, and reliability. Our cabling products are truly outstanding.

Products Sold:

- Networking Products
- Sharing, Converting, Extending
- Hardware and Security
- Cables
- Audio / Video
- USB and FireWire
- Add-On Cards
- Adapters
- KVM
- Input Devices
- Power
- Much more!

(888) 865-4639 | www.lindy-usa.com

Physical Infrastructure

SIMPLEX™ ISOLATION SYSTEMS

Since 1979, Simplex Isolation Systems has been setting new design standards in modular expandable cleanroom components, isolation curtains, hardware, and new product development. Fontana, Calif.,-based Simplex's unique strip doors and mounting systems are designed for quick installation. Simplex parts and materials perform with optimum efficiency, last longer, and save you money. And with Simplex, you are always backed by industry expertise, product knowledge, and the best warranties in the market.

Products Sold:

- Cleanrooms
- Enclosures
- Strip doors
- Curtains

(877) 746-7540 | www.simplexisolationsystems.com

Physical Infrastructure

HM CRAGG
Quality People. Quality Power.

As an integrator and master distributor providing quality power solutions, HM Cragg has built a reputation as the company that delivers innovation to aid and satisfy its customers. HM Cragg was founded in 1968 and is 100% employee-owned, focusing on quality people and exceptional products.

Products Sold:

- AC and DC power solutions (UPSes, power distribution)
- Control and monitoring (environmental and power)
- Connectors and cables (cord sets, ePDU cables)
- Cooling and Racks (airflow management, portable cooling)

(800) 672-7244 | www.hmcragg.com

Physical Infrastructure

AUSTIN HUGHES®

Founded in 1995, Austin Hughes Electronics Ltd. is a design and manufacturing group that offers a broad range of solutions based around 19-inch rackmount technology. With a wealth of experience, Austin Hughes design and development teams are focused to rapidly transform customer requirements and market trends into saleable solutions.

Products Sold:

- Infra solution Cabinet Smartcard Handles
- InfraPower Cabinet Intelligent PDUs
- CyberView Rackmount KVM & LCD Console Drawer
- Environmental Sensors

(510) 794-2888 | www.Austin-Hughes.com

Physical Infrastructure

BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

Products Sold:

- Power control, distribution, management, and metering
- Power transfer switches
- Console management and remote site management

(800) 523-2702 | www.baytech.net

Physical Infrastructure

AVTECH Software, founded in 1988, is focused on making the monitoring and management of systems, servers, networks, and data center environments easier. AVTECH provides powerful, easy-to-use software and hardware that saves organizations time and money while improving operational efficiency and preparedness. AVTECH products use advanced alerting technologies to communicate critical status information and can perform automatic corrective actions.

Products Sold:

A full range of products that monitor the IT and facilities environment, including temperature, humidity, power, flood, room entry, and UPS.

(888) 220-6700 | www.AVTECH.com

Physical Infrastructure

Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Pa.

Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 | www.sensaphone.com

Storage

Founded in 1994, Paragon Software Group is an innovative software developer focused on two markets. The company's comprehensive product line for the data storage market addresses the needs of data security, storage, and management for PCs, servers, and networks. A second portfolio of products focuses on mobile productivity applications for handheld devices. Paragon Software Group has offices in the United States, Germany, Japan, Poland, Russia, and China delivering its solutions to consumers, small business and enterprise clients worldwide.

Products Sold:

- Backup and Disaster Recovery
- Imaging, Migration, Deployment
- Partition Management

(888) 347-5462 | www.paragon-software.com

Storage

Boasting more than 20 years of experience in the industrial computing market, iStarUSA Group has made its mark in the design and manufacture of rackmount chassis, industrial power supplies, data storage, enclosed cabinets and racks, and custom power solutions. The group reaches a number of vertical markets via its four divisions: Claytek, iStarUSA, RaidAge, and Xeal.

Products Sold:

- Claytek: Racks and enclosures
- iStarUSA: Industrial chassis
- RaidAge: Data storage
- Xeal: Industrial power

(888) 989-1189 | www.istarusa.com

Servers

Chenbro is a leader in enclosure solutions, selling its products primarily to system integrators and OEM and channel partners. The company's extensive research and development efforts help it to keep its competitive edge and maintain market leadership, with special focus on thermal, EMI, and acoustic solutions. Taiwan-based Chenbro has offices in the United States, UK, The Netherlands, and China.

Products Sold:

- A comprehensive line of PC chassis, server/workstation chassis, rackmount chassis, and HDD enclosures.

(909) 947-3200 | www.chenbro.com

Servers

Supermicro® (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology, is a premier provider of advanced server Building Block Solutions® for enterprise IT, data center, cloud computing, HPC, and embedded systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative by providing customers with the most energy-efficient, environmentally-friendly solutions available on the market.

Products Sold:

- Servers
- Motherboards
- Chassis
- Network switches
- Storage solutions
- Blade servers
- GPU servers
- Embedded

(408) 503-8000 | www.supermicro.com

Servers

ServerMonkey stocks and delivers new and refurbished servers and networking equipment. Our blend of low prices, high quality, and exceptional service offers a unique opportunity for corporate IT groups to economize without compromising.

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- Processors
- Server Accessories

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Clients

Brady Corporation is an international manufacturer and marketer of complete solutions that identify and protect premises, products and people. Its products help customers increase safety, security, productivity and performance and include high-performance labels and signs, safety devices, printing systems and software, and precision die-cut materials. Brady is headquartered in Milwaukee and employs more than 6,900 people at operations in the Americas, Europe and Asia-Pacific.

Products Sold:

- Industrial labels, printers and software
- Safety and facility identification
- Education technology products and solutions
- Secure photo identification and access control

(800) 541-1686 | www.bradycorp.com

Equipment Dealer

In 1987, Pegasus Computer Marketing started providing mainframe products to the end-user market. What began as a sales-only organization soon adapted to offer in-house repair and refurbishment. During the past 10 years, Pegasus has focused primarily on the point-of-sale and barcode industries, buying, selling, and providing service contracts for anywhere from a few scanners to hundreds.

Products Sold:

We buy, sell, and service:

- Point-Of-Sale Equipment and POS/PC Flat Panels
- Wired and Wireless Barcode Hardware
- Kronos Time Clocks and Accessories

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